

Cot Life 2000

Critique of the UK Limerick Report

Following is an overview of the 1998 UK Limerick Report regarding the toxic gas theory for cot death (SIDS). Contrary to media publicity, the Limerick Report did not disprove the toxic gas theory - in fact, it provides further confirmation of it.

BACKGROUND

At the end of 1994 the British Government faced huge potential legal claims by bereaved parents. In the 1980s the Government had required manufacturers to include a fire retardant in cot mattresses, and had approved antimony trioxide for the purpose. The result was the generation within cot mattresses of stibine gas, which caused thousands of cot deaths. If the Limerick Report had supported the toxic gas theory for cot death, the British Government would have been liable for millions of pounds in damages.

What did the Limerick Committee investigate?

They investigated whether certain toxic gases are generated from fire retardant chemicals contained in PVC-covered cot mattresses.

Was this a full investigation of the toxic gas theory for cot death?

No. It had serious limitations:

- The Limerick Committee did not investigate any mattresses other than those covered with PVC.

- They did not investigate natural products used as bedding (despite the fact that many cot deaths occur on such materials, e.g. sheepskins).

- They focused on only one of the three relevant gases (stibine).

How then does the Limerick Report provide confirmation of the toxic gas theory?

It confirms (yet again) the gas generation which causes cot death: the Limerick Committee achieved generation of a form of stibine. Other researchers had already proved the generation of all three gases: phosphines from phosphorus, arsines from arsenic and stibines from antimony.

But the Report's conclusion states that the toxic gas theory is unsubstantiated. Why?

Although the Limerick Committee had replicated the toxic gas generation (which had been earlier proved by UK scientist Barry Richardson), they said such gas was not the cause of cot death. This conclusion was based on a large number of errors and irrelevancies. For example:

The Report stated that one particular fungus which can cause gas generation (*S. brevicaulis*) was not found on any mattresses on which babies had died of cot death.

Irrelevant. *The Committee found S. brevicaulis and many other micro-organisms on cot mattresses - and a number of these are capable of generating toxic gas if phosphorus, arsenic or antimony are present in a mattress. Whether babies had died on the mattresses tested by the Committee is immaterial.*

Household fungi become established in nearly every mattress which is slept on, and in underbedding which is washed infrequently.

The Report stated that what Richardson had identified as a fungus was actually bacteria.

Irrelevant. *Bacteria as well as fungi can generate toxic gas from the chemicals concerned.*

The Report stated that while toxic gas was produced under laboratory conditions, no gas could be produced in cot conditions.

Irrelevant. *Gas generation had already been achieved in cot conditions, and failure by the Limerick Committee to do so did not negate this fact. Various researchers have found it difficult to achieve gas generation consistently using media with a neutral pH. But the pH of a cot mattress is often higher, owing to the conversion of urea to ammonia. Experiments carried out using high pH (say, 10) have achieved more consistent gas generation. In these tests fungus flourished and the amount of gas produced was greater than at neutral pH.*

The Report stated that cot death babies did not show the typical physiological effects of phosphine, arsine or stibine poisoning, e.g. haemolysis and pulmonary oedema.

Of course they didn't. *Babies die so quickly from this type of poisoning that these effects don't have time to develop.*

Haemolysis, for example, takes many hours to develop; so does pulmonary oedema. But this gaseous poisoning can kill a baby within minutes.

The toxicological data contained in the Report relates to adults and older children. None of it relates to babies - and it is well known that babies' blood and physiological responses differ materially from those of older children and adults.

The Report stated that cot death babies had the same amount of antimony in their body tissue as babies who had died of other causes.

Wrong. *Research carried out in 1994 showed that post-mortem body tissue of cot death babies contained many times more antimony than tissue of babies who had died of other causes.*

The Report stated that antimony present in the tissue of cot death babies could have come from many sources other than their mattresses.

Wrong. *The same 1994 research showed that the body tissue of babies who had died of causes other than cot death contained no detectable antimony (or in one case very little). If the Report were correct, there would have been similar amounts of antimony in the tissue of all the babies tested, whether they had died of cot death or of other causes.*

The Report stated that the introduction of antimony and phosphorus into mattresses in Britain did not coincide with a rise in the cot death rate.

Wrong. *These chemicals were first introduced into cot mattresses in the early 1950s, and the British cot death rate increased steadily from that time onwards. (In fact the term "cot death" was coined in 1954 as a result of the marked increase in the number of such deaths.)*

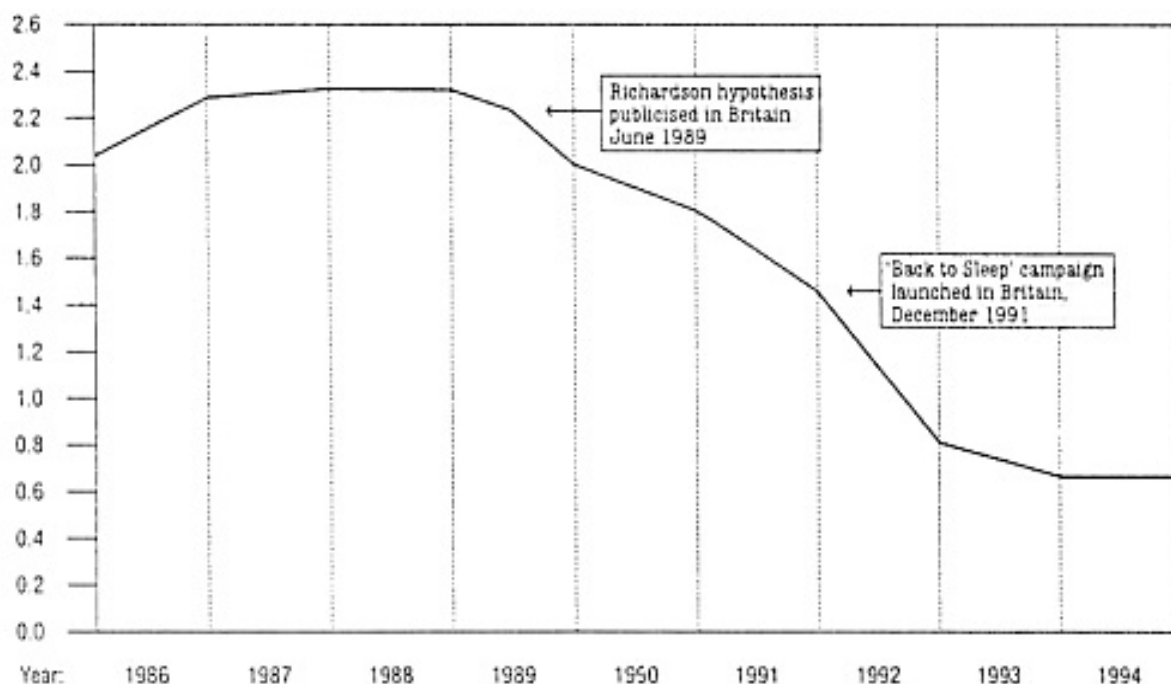
The highest cot death rate in Britain (2.3 deaths per 1000 live births in 1986-1988) coincided with the highest concentration of antimony in cot mattresses. The British Government had required a fire retardant to be incorporated in cot mattresses by 1988. Manufacturers were given four years' warning and during this period moved towards compliance with the new standard.

The Report stated that the steepest fall in cot deaths in Britain occurred when antimony was very prevalent in cot mattresses and coincided with the "Back to Sleep" campaign.

Highly misleading. *Certainly the British cot death rate fell while the amount of antimony in mattresses was high - but that was because from mid-1989 onwards parents took preventive measures against toxic gas generated in their babies' mattresses. Furthermore, manufacturers began to remove antimony from mattresses.*

In June 1989 the toxic gas theory was publicised nationwide and the cot death rate immediately began to fall (see graph). It had fallen 38 % (to about 1.4 deaths per 1000 live births) by the time "Back to Sleep" was launched in December 1991 - two-and-a-half years later. The fall was steepest following the commencement of "Back to Sleep" because that

Cot death rate per 1000 live births: Britain, 1986–1994



campaign added to the success already being achieved by advice based on the toxic gas theory.

What about the claim in the Report that three babies in the United Kingdom have died of cot death on polythene-wrapped mattresses?

This claim, which is said to derive from the UK CESDI Study, is unsubstantiated. In order to be valid, such a claim requires chemical analysis of the plastic mattress wraps on which the babies died - however, no such analyses were carried out. Furthermore, the bedding used on top of the plastic wraps was not analysed for the presence of phosphorus, arsenic and antimony.

In February 2000 Dr Peter Fleming (a co-author of the Limerick Report and principal author of the UK CESDI Report) conceded that the claim that three babies in the United Kingdom had died of cot death on polythene-covered mattresses could not be substantiated.

Are there other research findings which support the toxic gas theory for cot death?

Yes. For a list of research which confirms and supports the toxic gas theory, click on the sidebar heading **Research**. Examples of such research are as follows:

Two Scottish research studies (published in the *British Medical Journal* in 1997 and 2002) have shown that cot death risk rises as mattresses are re-used from one baby to the next. This is because micro-organisms become better established in a mattress as it is used. Then when re-use commences, toxic gas is generated sooner and in greater volume.

Statistics show that the cot death rate jumps from first babies to second babies in families; and jumps again from second babies to third babies; and rises still further for later babies. The reason is that parents frequently buy a new mattress for their first baby and then re-use it for subsequent babies. (For more information click on the sidebar heading **Cot death: no medical cause.**)

US research (published in the *Journal of Neuropathology & Experimental Neurology* in 1997) reported that cot death babies show neurochemical deficits relating to heart function and breathing. This is accounted for by the fact that phosphines, arsines and stibines are all "nerve gases". They shut down the central nervous system, causing cessation of heart and breathing functions. (This is why cot death babies do not show any apparent symptoms.) 1.

The conclusions of the Limerick Report should be disregarded. Other researchers have disproved them; and so has the practical experience of mattress-wrapping in New Zealand.

Since the adoption of mattress-wrapping in 1995, the New Zealand cot death rate (which had been static for three years) has reduced by 70%, and the NZ European/Pakeha rate has reduced by around 85%. These reductions in New Zealand cot death rates cannot be attributed to orthodox cot death prevention advice (e.g. face-up sleeping). There has been no material change to that advice in New Zealand since 1992.

Since mattress-wrapping commenced, around 820 cot deaths have occurred in New Zealand on unwrapped mattresses (or parallel bedding situations) *versus* nil cot deaths on wrapped mattresses.

If mattress-wrapping did not prevent cot death, many cot deaths would by now have occurred in New Zealand on polythene-wrapped mattresses; however no such death has been reported.

The outcome of the New Zealand mattress-wrapping campaign proves conclusively that there is only one cause of cot death; that mattress-wrapping prevents cot death; and that the toxic gas theory for cot death is correct.